ABSTRACT

The present invention discloses a process and apparatus for improving the catalyst life and efficiency in a gas flow catalyst bed reactor assembly. The reactor comprises an outer reaction vessel, an inner displacement cylinder, and an annular catalyst bed surrounding the displacement cylinder having a top half and a bottom half. Fluid flow improvement is achieved by adding at least one baffle to the top half of the displacement cylinder to improve uniformity of fluid flow in the reaction vessel and across the catalyst bed. Also disclosed is a process for improving fluid flow uniformity in a gas phase reactor comprising an outer reaction vessel, an inner displacement vessel having a top half and a bottom half and a reaction outer surface and an inert inner space, and an annular catalyst bed. The process comprises conducting fluid flow simulations using actual reactor conditions. During simulation, baffles are added on the outer reaction surface of the displacement reactor to improve simulated fluid flow. The baffles are added to the displacement cylinder by entering the inner inert space of the cylinder and attaching the baffles to the reaction outer surface from the inner inert space. The process allows the modification of existing reactors without disassembling the reactor.